



## PUBLIC REPORT 2010

### Controlling Corporation

Coogee Chemicals Pty Ltd

### Period to which this report relates

Start 1 July 2005

End 30 June 2010

(eg. for a Corporate Group with the trigger-year 2005-06, the report will cover the period 1.7.2006-30.6.2010)

### Part 1 – Information on assessments completed to date

**Table 1.1 – Description of the way in which the Corporate Group (or part of it) has carried out its assessments**

Coogee Chemicals Pty Ltd undertook an Energy Efficiency Opportunities assessment of the Coogee Energy Pty Ltd facility (Laverton North, Victoria) commencing in June 2008 and finishing in June 2009.

A detailed review of energy consumption data from 2006/07 and 2007/08 to >95% accuracy was compiled and used as the basis of the opportunity brainstorming workshop. The workshop participants were drawn from a cross section of the entire site workforce and 2 independent persons including the facilitator. 24 opportunities were identified as requiring further evaluation. Based on the detailed evaluation 9 opportunities have been implemented and 15 opportunities have not been implemented due to a variety of reasons including safety, technical feasibility and payback.

The Coogee Energy facility assessment has complied with the intent and key requirements of the EEO legislation.

Coogee Chemicals has commenced an EEO assessment of the Coogee Chlor-alkali business unit comprising facilities in Kemerton & Kwinana, both in WA. The assessment has focussed on the Kemerton facility and the findings will be applied to the Kwinana facility by the representative assessment process.

A detailed review of energy consumption data from 2007 & 2008 calendar years to >95% accuracy was compiled of both facilities and used as the basis for an opportunity brainstorming workshop in May 2009. The workshop participants were drawn from a cross section of the entire Kemerton facility, the Kwinana facility Management team and 2 independent persons including the facilitator. 13 opportunities relating to the Kemerton facility were identified and evaluated further. Based on the detailed evaluation 2 opportunities have been approved for implementation and 11 have been decided not for implementation based on a variety of technical feasibility and payback considerations.



The Kemerton Chlor-alkali facility assessment and the Kwinana Chlor-alkali facility representation assessment had complied with the intent and key requirements of the EEO legislation and will have fully met these requirements at the conclusion of the assessment scheduled for June 2011.

Regular progress updates are communicated both formally to the Coogee Chemicals board and via regular newsletter and general meeting presentations to the remainder of the employee workforce.

**Table 1.2 – Energy use assessed**

Group member and/or business unit and/or key activity and/or site (or part thereof) that has had an assessment completed by 30 June 2010 (Include all assessments completed to date for the current 5 year cycle).	Period over which assessment was undertaken <sup>1</sup>	Energy use for the period 1.7.2009 to 30 June 2010 of the assessed entity (or part thereof) expressed in GJ <sup>2</sup>
Coogee Energy Pty Ltd	June 2008 – June 2009	575,000 GJ
Coogee Chemicals Chlor-alkali Kemerton Facility	Oct 2008 – Dec 2010	223,000 GJ
<b>Total energy use of assessed entities (or part thereof)</b>		<b>798,000 GJ</b>
<b>Total energy use of the whole corporate group in the period 1.7.2009 to 30 June 2010</b>		<b>1,060,000</b>
<b>Total energy use of assessed entities (or part thereof) for the period 1.7.2009 to 30.6.2010 expressed as a percentage of total energy use for the period 1.7.2009 to 30.6.2010</b>		<b>75%</b>

1. This should be the start and finish date (month and year) for the assessment (planned assessment dates were nominated in Table 3.1 of the approved ARS).

2. Energy Bandwidth may only be used if approved in the Assessment and Reporting Schedule.

**Table 1.3 – Accuracy of energy use assessed data**

Entity	% achieved	Reasons for not achieving data accuracy to within $\pm 5\%$
Coogee Energy Pty Ltd	$\pm 5\%$	
Coogee Chemicals Chlor-alkali Kemerton Facility	$\pm 5\%$	



## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2A - New assessments completed or not reported since your last Public Report

Name of Group member or business unit or key activity or site: Coogee Chemicals Chlor-alkali Kemerton Facility

Total energy use for the period 1.7.2009 to 30.6.2010 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

223,000

GJ

**Table 2.1 – Opportunities assessed to an accuracy of better than or equal to ( $\leq$ )  $\pm 30\%$**

Status of opportunities identified		Total Number of opportunities	Estimated energy savings per annum by payback period (GJ)						Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – ≤ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Under Investigation	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	To be Implemented	2	1	371	1	70	Nil	Nil	441
	Implementation Commenced	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0
	Implemented	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0
	Not to be Implemented	11	1	856	1	1597	9	36,679	39,132
Outcomes of assessment	Total Identified	13	2	1,227	2	1,667	9	36,679	39,573

## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2B - Update of assessments reported in previous Public Reports

Name of Group member or business unit or key activity or site: Coogee Energy Pty Ltd

Total energy use for the period 1.7.2009 to 30.6.2010 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

575,000	GJ
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**Table 2.3 – Opportunities assessed to an accuracy of better than or equal to ( $\leq$ )  $\pm 30\%$**

Status of opportunities identified		Total Number of opportunities	Estimated energy savings per annum by payback period (GJ)						Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – ≤ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Under Investigation	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	To be Implemented	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	Implementation Commenced	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	Implemented	4 (4)	2 (2)	89 (89)	1 (1)	41 (41)	1 (1)	71 (71)	201 (201)
	Not to be Implemented	7 (7)	Nil (Nil)	Nil (Nil)	1 (1)	154 (154)	6 (6)	6,653 (6,653)	6,634 (6,634)
Outcomes of assessment	Total Identified	11 (11)	2 (2)	89 (89)	2 (2)	195 (195)	7 (7)	6,724 (6,724)	7,008 (7,008)

**Table 2.4 – Opportunities assessed to an accuracy of worse than (>) ±30%**

Status of opportunities identified		Total Number of opportunities	Estimated energy savings per annum by payback period (GJ)						Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – ≤ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Under Investigation	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	To be Implemented	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	Implementation Commenced	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)
	Implemented	5 (5)	Nil (Nil)	Nil (Nil)	1 (1)	10,000 (10,000)	4 (4)	Nil (Nil)	10,000 (10,000)
	Not to be Implemented	8 (8)	Nil (Nil)	Nil (Nil)	Nil (Nil)	Nil (Nil)	8 (8)	Nil (Nil)	Nil (Nil)
Outcomes of assessment	Total Identified	13 (13)	Nil (Nil)	Nil (Nil)	1 (1)	10,000 (10,000)	12 (12)	Nil (Nil)	10,000 (10,000)

**Note**

1. Eight opportunities have not to be implemented due to significant safety and environmental concerns or are technically not feasible at this point in time.
2. Three opportunities have been implemented with simple changes to operational procedures, these all have very minor benefits and have been implemented without the cost benefit being formally assessed.
3. One opportunity being the installation of a Baffled Gas Heated Reformer has been implemented through an ongoing research and development program and confirmed energy savings are not available at this time.



## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2C - Details of at least three significant opportunities found through EEO assessments

**Table 2.5 – Description of 3 significant opportunities**

#### **Opportunity 1 – Coogee Energy – Refining Column Packing**

The design of the Coogee Energy Methanol Process enables it to be used in floating marine platform environments due to the compact nature. Accordingly the distillation section of the plant uses packed columns rather than ordinary tray column design. The flow characteristics and cleanliness of the packing affects the column efficiency and so impacts on energy consumption (ie steam). Whilst it was possible to remove the existing packing, clean it, and then re-install, Coogee has elected to install a new and improved packing design. This was the first time that this packing design has been used in a methanol plant and it is expected to improve mass transfer characteristics leading to increased column efficiency through the elimination of additional steam use in distillation. Accordingly less energy would be required for the same amount of product made.

#### **Opportunity 2 – Coogee Energy – Baffled Gas Heated Reformer**

The Coogee Energy Methanol Plant is the only methanol plant in the world that utilizes a combined Gas Heated Reformer (GHR) and Auto-thermal Reactor to generate synthesis gas. The GHR is a key part of the process design and is an area of opportunity where small efficiency gains can lead to significant reductions in overall energy consumption. As part of Coogee's commitment to innovation and process development, an improved internal design of GHR was installed in December 2008. The baffled design is the first of its kind in operation at a methanol plant world-wide and it is expected to lead to an increase in overall energy efficiency as heat transfer should remain over a longer period of time (ie. A reduced fouling rate). The new design may also allow the reactor to operate at lower steam ratios, which will directly reduce energy consumption across the entire process. A series of trials to determine optimum operating parameters is ongoing.



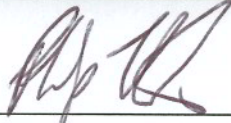
### Opportunity 3 – Coogee Chlor-alkali – Utilization of Excess Hydrogen into Hydrogen Fuel Cells

Coogee Chemicals produces chlorine gas and caustic soda from the electrolysis of concentrated salt solutions at its chlor-alkali facilities. A by product of the process is hydrogen gas which is currently used to as a boiler feed gas (instead of natural gas) and in the production of hydrochloric acid, but any excess that cannot be used is burnt, producing water as it is impractical to store the hydrogen gas for later use. An opportunity was identified to utilize the excess hydrogen in hydrogen fuel cells. Whilst the opportunity could be potentially financially viable in the future there are also significant technical barriers to the use of the technology at this point.

## Part 4 - Declaration

**Table 4.1 - Declaration of accuracy and compliance (mandatory information)**

The information included in this report has been reviewed and noted by the board of directors and is to the best of my knowledge, correct and in accordance with the *Energy Efficiency Opportunities Act 2006* and *Energy Efficiency Opportunities Regulations 2006*.


Phil Thick, CEO
Date 5/1/11